

**UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

SOLAS OLED LTD., an Irish corporation,

Plaintiff,

v.

SAMSUNG DISPLAY CO., LTD.,
a Korean corporation;

SAMSUNG ELECTRONICS CO., LTD.,
a Korean corporation; and

SAMSUNG ELECTRONICS AMERICA,
INC., a New York corporation,

Defendants.

Case No. 2:21-cv-00104-JRG

SOLAS'S OPENING CLAIM CONSTRUCTION BRIEF

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I. INTRODUCTION

Plaintiff Solas OLED Ltd. (“Solas”) and Defendants (collectively “Samsung”) offer not just competing proposals, but fundamentally different approaches to claim construction. The Federal Circuit has set forth straightforward rules to guide claim construction. For example, where claim terms have a plain and ordinary meaning in the field, that meaning almost always controls. And where described embodiments are narrower than the claims, features of embodiments should not be imported into the claims unless the patentee evinces a clear intent to limit claim scope. Solas’s proposals follow Federal Circuit precedent. They are also faithful to the full intrinsic record and reflect how a person of ordinary skill in the art (“POSITA”) would understand the terms.

Samsung’s proposals, on the other hand, reflect a different and erroneous approach to claim construction. Samsung asks this Court to recharacterize and burden clear terms with artificial and extraneous baggage but cannot point to any clear and unmistakable disclaimer. This invites reversible error. Many of Samsung’s proposals are inconsistent with—and even exclude—embodiments taught in the specification. For other terms, Samsung’s proposals are inconsistent with the claim language itself. And across the board, Samsung’s proposed constructions lengthen and obfuscate the terms, making it harder for the jury to understand them.

The Court should reject Samsung’s proposals and adopt Solas’s proposals.

II. BACKGROUND OF ASSERTED PATENTS

A. U.S. Patent No. 7,499,042 (’042 Patent)

The ’042 patent addresses problems with active matrix OLED displays. *See* ’042 patent at Background of the Invention. Specifically, the ’042 patent recognizes that the transistors of such can vary or degrade over time, leading to inconsistent pixel brightness *See id.* at 2:7–28 (“the gate threshold voltage changes with time, or differs from one transistor to another That is, even

when the gate voltage having the same level is applied to the driving TFTs of a plurality of pixels, the luminance of the organic EL element changes from one pixel to another. This produces variations in luminance on the display screen.”).

The '042 patent addresses this problem by describing a display device with a plurality of selection scan lines, a plurality of current lines, and a data driving circuit. The driving circuit applies a reset voltage to the plurality of current lines and then supplies a designating current having a current value corresponding to an image signal. The pixel circuits then supply a driving current with a current value corresponding to the designating current which flows through the current lines. The pixel circuits loads the designating current which flows through the current lines and stores a level of voltage converted in accordance with the current value of the designating current. After the selection period is over, the pixel circuits shut off the designating current and supplies a driving current corresponding to the level of the voltage converted in accordance with the designating current.

B. U.S. Patent No. 7,663,615 ('615 Patent)

The '615 patent concerns driving circuitry for self-luminous displays that emit light due to the current flowing through pixel elements, such as displays utilizing organic electroluminescent or LED elements. '615 Background of the Invention. The current flowing through such devices is commonly controlled by a gate voltage on a drive transistor. But the relationship between the gate voltage and the current may change “depending on the usage time, the drive history and the like,” and in particular the minimum “threshold voltage” on the gate necessary to permit current flow may shift. Thus, “it becomes difficult to stably realize the light emission operation at the appropriate luminance gradation sequence in accordance with the display data for a long time.”

The '615 patent provides structures and methods for driving the pixel circuits that solve problems in the prior art, including through a light emission drive circuit that can apply a current control type (or a current drive type) of light emission element emitting light at a predetermined luminance gradation sequence by supplying a current in accordance with the display data to plural display panels (pixel arrays). *Abstract*. Various embodiments are shown in the figures, including Fig. 15, which is “an example of the entire structure of a display unit.” '615 patent at 16:32–34.

III. CLAIM CONSTRUCTION PRINCIPLES

The “claim construction inquiry . . . begins and ends in all cases with the actual words of the claim.” *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1324 (Fed. Cir. 2002). Indeed, “the claims themselves provide substantial guidance as to the meaning of [] terms.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005).

Thus, when conducting a claim construction inquiry, “district courts are not (and should not be) required to construe every limitation present in a patent’s asserted claims.” *O2 Micro Int’l v. Beyond Innovation Tech.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008). This is because claim construction is “not an obligatory exercise in redundancy.” *US Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). Where a term is used in accordance with its plain meaning, the court should not replace it with different language. *Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012) (“we do not redefine words. Only the patentee can do that.”).

To the contrary, there is a “heavy presumption” that claim terms carry their “full ordinary and customary meaning, unless [the accused infringer] can show the patentee expressly relinquished claim scope.” *Epistar Corp. v. ITC*, 566 F.3d 1321, 1334 (Fed. Cir. 2009). Because that plain meaning “is the meaning that the term would have to a [POSITA] in question at the time of the

invention,” construing claims often “involves little more than the application of the widely accepted meaning of commonly understood words.” *Phillips*, 415 F.3d at 1313-14.

“There are only two exceptions” in which claim terms are not given their full ordinary and customary meaning: “1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner*, 669 F.3d at 1365. Without clear and unambiguous disclaimer or lexicography, courts “do not import limitations into claims from examples or embodiments appearing only in a patent’s written description, even when a specification describes very specific embodiments of the invention or even describes only a single embodiment.” *JVW Enters. v. Interact Accessories, Inc.*, 424 F.3d 1324, 1335 (Fed. Cir. 2005). Similarly, a statement in patent does not limit the claims unless the statement is a “clear and unambiguous disavowal of claim scope.” *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1322–23 (Fed. Cir. 2003).

IV. AGREED TERMS

The parties have agreed to the following constructions:

Claim Term / Asserted Claim(s)	Agreed Construction
“gradation” (‘615 patent, claim 11)	“level”
“the operation” (‘615 patent, claim 11)	Within the claim phrase “a drive voltage for making the light emission control section perform the operation” the term “the operation” refers to “generating a light emission drive current having a predetermined current value in accordance with the electric charges accumulated in the electric charge accumulating section and supplying the light emission drive current to the light emission element”

V. DISPUTED TERMS FOR '042 PATENT

A. “the selection period” ('042 patent claim 1)

Solas’s Proposed Construction	Samsung’s Proposed Construction
“time period during which a plurality of pixel circuits is selected”	“the time interval during which <u>the ON voltage</u> is applied to <u>one</u> selection scan line”

The “selection period” of claim 1 is described throughout the '042 patent in non-limiting language. For example, in regard to Figure 4, the specification explains that “a period in which the selection scan driver 5 ... selects the selection scan line X_i in the i th row *is called a selection period* TSE of the i th row.” '042 patent at 9:22-27 (emphasis added). The specification also describes the “selection scan line” comprises “a plurality of pixel circuits.” *Id.* at 2:46-48 (Brief Summary of Invention: “a plurality of pixel circuits which are connected to the plurality of selection scan lines”); at 3:17-20 (Brief Summary of Invention: “A display panel driving method according to still another aspect of the present invention comprises, a selection step of sequentially selecting a plurality of selection scan lines of a display panel comprising a plurality of pixel circuits”); (“In the second transistor 22 of each of the pixel circuits $D_{i,1}$ to $D_{i,n}$ in the i th row, a gate 22 g is connected to the selection scan line X_i in the i th row”); Ex. 1 ¶ 41. In other words, in the specification, the “selection period” is something that belongs to a row of pixel circuits, not to any particular line in the circuit. Solas’s proposal captures the “selection period” described the patent specification.

Samsung’s proposal improperly deviates from the plain meaning of the term and seeks to limit it to particular embodiments of the '042 patent, ignoring the actual language of the claim in the process. For example, Samsung limits the selection to using an “ON voltage,” which may be one way of selecting something, but is surely not the only way. As Solas’s expert Mr. Flasck

explains in his declaration, use of a high-level “ON voltage” to select is described in the specification in the context of a preferred embodiment using NMOS (N-channel) transistors. Ex. 1 ¶¶ 43–44. Nothing in the claims or specification supports excluding the use of PMOS (P-channel) transistors instead. *Id.*; *see* ’042 patent at 22:24–25 (describing the use of P-channel transistors in a “second embodiment”). Nothing in the intrinsic record or other evidence cited by Samsung justifies limiting the claims to a specific type of transistor or a specific manner of selecting.

Moreover, Samsung limits the “selection” process to applying that ON voltage to *one* selection line. Again, that may be how certain disclosed embodiments of the patent work, but that alone does not justify limiting the claims in this manner. Furthermore, the claim states that the selection scan driver “selects said *plurality* of selection scan lines in each selection period.” ’042 patent at 29:13. Where the claim expressly refers to selecting a “plurality” of selection scan lines, it would be improper to limit the claim to applying a voltage to only *one* selection scan line. *See Hill-Rom Services, Inc. v. Stryker Corp.*, 755 F.3d 1367, 1371 (Fed. Cir. 2014) (“the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using ‘words or expressions of manifest exclusion or restriction.’”).

Samsung’s proposal suffers from a further flaw to the extent that Samsung intends it to mean that the “selection period” is when—and only when—the ON voltage is applied to one selection scan line. Claim 1 describes multiple things occurring “in [the] selection period,” which is further described as having a “first part” and a “second part.” ’042 patent at 20:12–36. Selecting scan lines, applying a reset voltage, supplying a designating current, and storing a voltage based on a designating current are all things that the claim 1 describes as happening “in” the selection period. *Id.* To equate the “selection period” with just one of the things that the claim says occurs “in” the period (selecting the selection scan lines) is improper, and Samsung’s proposal should be rejected.

B. “sequentially selects said plurality of selection scan lines in each selection period” (’042 patent claim 1)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning	“applies an ON voltage to the selection scan lines one after the other, such that one selection scan line is selected in each selection period”

This phrase includes only words and phrases that have a plain and ordinary meaning to a POSITA. Ex. 1 ¶ 49. Moreover, the intrinsic record does not depart from the plain and ordinary meaning of this phrase. *Id.* Samsung’s proposal improperly seeks to limit the claims in the same manner as its construction for “selection period” discussed above. As explained above, there is no justification in the intrinsic record or evidence cited by Samsung for limiting the claims to use of “an ON voltage” or to selecting only **one** selection scan line in any particular selection period.

Samsung’s construction further imposes an unduly narrow view of the word “sequentially.” Merriam Webster’s defines “sequential” as “following in sequence.” Ex. 6 at 8. Synonyms are “consecutive” and “succeeding.” *Id.* Dictionary.com similarly defines “sequence” as “the following of one thing after another; sequential” and “sequential” as “following; subsequent; consequent.” Ex. 7 at 6. The term has a simple and consistent plain meaning. Ex. 1 ¶ 50. Nothing in this plain meaning suggests that the reference to “sequentially select[ing] said plurality of selection scan lines” requires selecting one and only one scan line during a “selection period.” Rather, the claim expressly refers to “sequentially select[ing] said **plurality** of selection scan lines,” and encompasses scenarios where the selection of scan lines may overlap, or may occur during the same “selection period.” Samsung’s effort to improperly narrow this claim and limit it to particular embodiments should be rejected, and the term should instead be given its full plain and ordinary meaning.

C. “pixel circuit” (’042 patent claim 1)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, i.e., the circuit that includes switching and/or storage elements used to drive a light emission element of a pixel	“the circuit that includes the switching and storage elements used to drive a light emission element of a pixel”

The term “pixel circuit” has a plain and ordinary meaning in the art and the ’042 patent uses the term “pixel circuit” in accordance with its plain and ordinary meaning, i.e., the circuit that includes switching and/or storage elements used to drive a light emission element of a pixel. Ex. 1 ¶ 60. Samsung appears to largely agree this is the plain and ordinary meaning of “pixel circuit” but requires that “pixel circuit” include “*the* switching *and* storage elements” used to drive an OLED. *Id.*

As an initial matter, it is unclear what Samsung’s proposal means where it refers to “the switching and storage elements” used to drive an OLED element of a pixel. Samsung may intend “switching ... elements” to be the structures of the pixel circuit which “shuts off the designating current which flows through said plurality of current lines” as required in claim 1. Samsung may also intend “storage elements” to refer to how each of the claimed pixel circuits “stores a level of a voltage converted in accordance with the current value of the designating current.” *Id.* cl. 1. If this is the case, the additional limitations are superfluous and do nothing to the scope of the claim except to potentially improperly limit it by requiring the presence of “elements” within the circuit. *See* Ex. 1 ¶ 61.

Alternatively, Samsung may intend for “the switching and storage elements” to encompass *all* “switching” and “storage” elements which are “used drive a light emission element of a pixel,” even if a POSITA would typically not understand some elements fitting that description as being

a part of the “pixel circuit.” As one example, the ‘042 patent’s Third Embodiment illustrates the switches S_{j+N} shown in Figure 3. They are switches which are used in driving the OLED pixels. ‘042 patent, 12:16-21 (“switch S_j (which is interposed between the current line Y_j in the j th column and the current terminal CT_j in the j th column) switches the state in which the current source driver 3 supplies the tone designating current $IDATA$ to the current line Y_j , and the state in which the reset voltage VR is applied to the current line Y_j .”). But switches S_{j+N} are not suggested by the ‘042 patent to be a part of the “pixel circuit,” and a POSITA would understand them to be a part of the current or column driver and not to be a part of the pixel circuit. For example, Figure 6 of the ‘042 patent shows the “circuit diagram of two adjacent pixels” which do not have the diagram components for the current/column driver. *See* Ex. 1 ¶ 62.

Samsung’s proposal carries an inherent ambiguity which has the potential to be expanded beyond the plain and ordinary meaning of “pixel circuit” by encompassing switches and storage elements outside of what a POSITA would understand a “pixel circuit” to be. *See* Ex. 1 ¶¶ 61-63. It should be rejected.

D. “current lines” (‘042 patent claim 1)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, i.e., lines through which a current flows	“conductive lines each of which connects a data driving circuit to a plurality of pixel circuits and carries both a designating current and a reset voltage”

The term “current lines” has a plain and ordinary meaning in the art and the ‘042 patent uses the term “current lines” in accordance with its plain and ordinary meaning, i.e., lines through which a current flows. Ex. 1 ¶¶ 55-56.

In a previous case involving the '042 patent, *Solas OLED Ld. v. HP Inc.*, Solas contended that current lines were “conductive lines for carrying current.” Solas’s position in this case as to the plain and ordinary meaning of “current lines” is substantially the same, except that Solas’s proposal does not have the adjective “conductive.” The addition of the adjective “conductive” is unnecessary given that the “lines through which a current flows” are, by their nature, conductive of current. *See* Ex. 1 ¶¶ 55-56.

Samsung’s proposal is flawed because it includes “pixel circuits” as part of the construction of “current lines.” Claim 1 already specifies that the claimed configuration is limited to a device having current lines connected to pixel circuits (reciting “a plurality of pixel circuits which are connected to said plurality of selection scan lines and said plurality of current lines”). Thus, only devices having pixel circuits and current lines are claimed. Further, it is unnecessary to include “data driving circuits” as part of the construction of “current lines.” Claim 1 already specifies that the claimed configuration is limited to a device having current lines to which voltage is applied by a data driving circuit, the latter of which also supplies a designating current to a plurality of current lines (reciting “a data driving circuit which applies a reset voltage to said plurality of current lines in a first part of the selection period, and supplies a designating current having a current value corresponding to an image signal to said plurality of current lines in a second part of the selection period after applying the reset voltage in the selection period”). Ex. 1 ¶¶ 56-57. Samsung’s proposal also requires “current lines” to “carry” “both a designating current and a reset voltage.” It is unnecessary to include this “carries” limitation as part of the construction of “current lines,” because the independent claims already require that a “designating current” and “reset voltage” be applied to a “plurality of current lines.” Thus, only devices having a plurality of current lines and

to which designating currents and reset voltages are applied are claimed. These additional limitations are not supported by the specification and are superfluous in view of the claim language. *Id.*

Moreover, Samsung’s proposal imposes functional and structural limitations on not only “current lines,” but also on other claim terms which are included within Samsung’s proposal for “current lines”: that is, Samsung requires “**each**” current line to “connect **a** data driving circuit to a plurality of pixel circuits and carries both a designating current and a reset voltage.” Samsung’s additional limitations of “each of which connects a data driving circuit to a plurality of pixel circuits” are not supported by the specification, which for example, describes that “a plurality of pixel circuits [] are connected to . . . the plurality of current lines.” ’042 Patent, Abstract. *See* Ex. 1 ¶ 58. The specification does not state that each **individual** current line must be connected to a plurality of pixel circuits and to only one data driving circuit. Samsung’s construction is incorrect and unsupported in this respect. Moreover, the ’042 patent contains no statements of lexicography or disclaimer that supports Samsung’s construction requiring “current lines” to be “conductive lines each of which connects a data driving circuit to a plurality of pixel circuits and carries both a designating current and a reset voltage.”

E. “designating current” (’042 patent claim 1)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, i.e., current designating a value corresponding to an image signal	“current set to a constant value to control the luminance of the OLED”

The term “designating current” has a plain and ordinary meaning to a POSITA and the ’042 patent uses the term consistent with this plain and ordinary meaning, i.e., current designating a value corresponding to an image signal. This is how the term is explained throughout the ’042

patent and the specification. For example, it is supported by the Abstract and Summary of the Invention, which uses the same language. *See* Ex. 1 ¶¶ 52-53.

Samsung's proposal imposes an additional requirement that the designating current have be "set to a constant value." There is no disclosure in the specification defining the designating current in this way. To the contrary, the specification never describes the designating current as set to a constant value during the first reset portion. *See* '042 patent at 11:54–59, 2:40–45. Further, Claim 1 itself describes that the "designating current" changes and is a value corresponding to an image signal. *See, e.g.,* '042 Patent Claim 1 ("wherein in the selection period, each of said plurality of pixel circuits loads the designating current which flows through said plurality of current lines"). This does not declare that during the whole selection period the designating current is held constant. In fact, the specification provides that the designating current in one embodiment is held constant only during the second portion of the selection period. This is consistent with the claim language, and completely inconsistent with Samsung's requirement in its proposed construction. In addition, Fig 1 shows the designating current, I_{data} , at the CT_n terminal. That I_{data} is the same on the current lines Y_j . However, Fig 9 explicitly shows that the designating current (Current of CT_j) is not constant, but in fact asymptotically approaches a stable value during the selection period. This is in direct contrast to Samsung's proposed construction. Samsung's proposal reads out a preferred embodiment. *See* Ex. 1 ¶ 53.

Samsung's proposal also imposes an additional requirement that the designating current have a functional limitation: that is, "to control the luminance of the OLED," which is unsupported by any intrinsic evidence or statements of lexicography or disclaimer. The '042 patent does not describe "designating current" as one which is responsible for the function of "controlling the luminance of the OLED," and to the contrary uniformly describes the designating current in a manner

that is consistent with Solas’s proposal: “having a current value corresponding to an image signal.” Samsung’s proposal appears to potentially be intended to replace “image signal” with “luminance of an OLED,” which is unsupported by any disclosure. *See* Ex. 1 ¶ 54.

VI. DISPUTED TERMS FOR ’615 PATENT

A. “exceeding a threshold value” (’615 patent claim 11)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, i.e., has an <u>absolute value larger than</u> that of a threshold value	“ <u>greater than</u> a threshold value”

As the ’615 patent expressly states, its invention can be applied using two different types of transistors: “all of [the transistors] may be n-channel types or all of them may be p-channel types. In the case where all of them are p-channel types, it is only necessary that high and low at the on level and the off level of the signal are inversed.” ’615 patent at 46:8–11.¹ For n-channel transistors, the “threshold” voltage of the transistor is a positive voltage, and the voltage applied to the gate of the transistor must be greater than (more positive than) the threshold voltage in order for current to flow through the transistor. Ex. 1 ¶¶ 80–81; Ex. 15 at 209:7–15. Where the drive transistor is an n-channel transistor—with a positive threshold value—what it means to “exceed” that positive value is straightforward, and the parties’ constructions give the same result.

Where the parties appear to part ways is when a p-channel transistor is used as the drive transistor. For a p-channel transistor, the threshold voltage has a *negative* value, and the voltage applied must be *more negative* in order for current to flow through the transistor. Ex. 1 ¶¶ 80–81;

¹ The difference between “n-channel” and “p-channel” transistors concerns the sign of the charge carriers that flow through the channel of the transistor. In n-channel transistors, the charge carriers are negatively-charged electrons, while in p-channel transistors, the charge carriers are positively-charged electron holes. *See* https://en.wikipedia.org/wiki/MOSFET#Types_of_MOSFET.

Ex. 15 at 209:7–15. Accordingly, as the '615 patent explains, the roles of high and low voltages in turning transistors on or off are “inversed” when n-channel transistors are replaced by p-channel transistors. '615 patent at 46:8–11. Solas’s construction properly recognizes this fact, as a POSITA reading the '615 patent would. Ex. 1 ¶ 80. For p-channel transistors, current flows when the applied voltage exceeds the threshold voltage in absolute value, i.e., when the applied voltage is *more negative* than the (negative) threshold value. Samsung’s proposal seeks to ignore what a POSITA would understand concerning p-channel transistors. Samsung’s position is that when the threshold voltage is negative, “exceeding” that threshold requires being *less negative*, i.e. having a value that turns the flow of current off.

The specification and claims of the '615 patent consistently and unambiguously support Solas’s proposed construction. They repeatedly emphasize that the relevant comparison is between the absolute values of the voltages: if the threshold is positive, exceeding that voltage means being *more positive*, and if the threshold is negative, exceeding that voltage means being *more positive*.

Six times, the specification states that the relevant comparison is between the absolute value of the gate-to-source voltage and the threshold voltage. '615 patent at 19:4–9; 23:64–67; 30:36–38; 44:49–62; 45:28–33; 45:43–48. For example, the specification states that:

the drive transistor Tr13 is set so as to arrive at the drive transistor *precharge voltage* $V_{pre\ 13}$ *higher than the threshold voltage* $V_{th\ 13}$ (namely, *the absolute value thereof is larger than that of the threshold voltage* $V_{th\ 13}$)

'615 patent at 23:64–67 (emphasis added). In other words, in the context of the '615 patent, for the precharge voltage to be “higher” than the threshold voltage means that it is greater in absolute value (more positive than a positive threshold voltage or more negative than a negative threshold voltage). This is exactly the same relationship that claim 11 is describing when it claims “a threshold voltage *exceeding* a threshold value of the drive transistor.” '615 patent at 48:57–58.

Claim 1 of the '615 patent supports this understanding of the relationship between the pre-charge voltage and the threshold voltage, requiring “a voltage [in a precharge time period] having an absolute value that is larger than an absolute value of a threshold voltage of the drive transistor.” '615 patent at 46:32–37. This language in claim 1 further confirms that a POSITA would understand that the precharge voltage must be “higher than” / “exceed” the threshold voltage in the sense of being more positive than or more negative than the threshold voltage, depending on the sign of the voltage.

Samsung may argue that claims 1 and 11 describe different inventions, with claim 1 comparing absolute values and claim 11 claiming a different comparison. But, there is nothing in the specification that suggests a different comparison. There is no teaching that for an embodiment with p-channel drive transistors, the pre-charge voltage should be *less negative* than the threshold voltage (or should even be positive). To the contrary, the specification consistently teaches comparing the absolute values of the voltages, such that the pre-charge voltage for a p-channel transistor is more negative than the threshold voltage. '615 patent at 19:4–9; 23:64–67; 30:36–38; 44:49–62; 45:28–33; 45:43–48.

Samsung may also argue that Solas's proposed construction is somehow problematic because it could be satisfied by a pre-charge voltage that has a greater absolute value than the threshold voltage but the opposite sign. This is not a valid criticism, because a POSITA would understand that the gate-to-source voltage applied will have the same sign as the threshold voltage, with positive voltages applied to n-channel transistors and negative voltages applied to p-channel transistors. Ex. 15 at 211:5–212:3. However, to the extent that Samsung does believe this issue is a concern, Solas would not object to construing “exceeding a threshold value” to mean “having a value more positive than the threshold value, if the threshold value is positive; or having a value

more negative than the threshold value, if the threshold value is negative.” Such a construction accords with the clear teachings of the specification and the understandings of a POSITA. Samsung’s contrary construction should be rejected.

B. “precharge voltage” (’615 patent claim 11)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, not indefinite.	Indefinite

The term “precharge voltage” is not indefinite. Claim 11 itself explains what a precharge voltage is, stating “the data driver applies a *precharge voltage* exceeding a threshold value of the drive transistor to the data line, and the light emission drive circuit applies the *precharge voltage* applied to the data line to the electric charge accumulating section via the writing control section.” Thus, the claim language teaches that the precharge voltage (a) exceeds a threshold value of the drive transistor, (b) is applied by the data driver to the data line, and (c) is applied by the light emission drive circuit to the electric charge accumulation section. Ex. 1 ¶ 69.

Further the specification gives detailed explanations about the function, magnitude, and timing of the precharge voltage. *See, e.g.*, ’615 patent at 7:28–38 (“a first potential difference step of setting a first potential difference on the basis of a precharge voltage that is larger than the minimum luminance gradation sequence necessary for generating the light emission drive current required for making the light emission element to perform the light emission operation at the minimum luminance gradation sequence or a threshold potential difference between the control terminal and one end of a current path of the drive transistor in which a current value of the light emission drive current is set by a potential difference between a control terminal and one end of the current path”); *see also id.* at 7:58–61, 8:30–32 Fig. 2 (“a timing chart showing a first example of the drive control operation of the light emission drive circuit according to the embodiment”);

Fig. 13 (“a timing chart showing a third example of the drive control operation of the light emission drive circuit according to the embodiment”).

Based on these teachings, a POSITA would readily understand that the precharge voltage, as taught in the specification is the voltage applied to the data line to compensate for the drive transistor Tr13 transistor threshold voltage and to avoid the “dead spot” as the bottom of the grayscale curve as shown in Figure 8. In other words, a POSITA would understand that the precharge voltage is a component of the Gradation Sequence Signal to enhance pixel brightness accuracy. *See* Ex. 1 ¶ 70.

Solas expects Samsung may contend that the '615 patent discusses two types of “precharge voltage” (V_{pre} and V_{pre13}) and that such discussion would cause a POSITA to not be able to understand “precharge voltage” with reasonable certainty. However, a POSITA would understand there is no ambiguity and the claim “precharge voltage” corresponds to V_{pre} as described in the specification.

A POSITA would readily understand that the V_{pre} and V_{pre13} voltages described in the specification are *two different voltages* applied to *two different components*. The first voltage, V_{pre} , is the voltage applied to the data line DL. '615 Patent at 20:38–40 (“the selection transistor Tr 12 is turned on and *the data line DL to which the precharge Voltage V_{pre} is applied . . .*”). The second voltage, V_{pre13} , is the voltage applied to the capacitor C_s and appears across the gate source of transistor T13 as a result of V_{pre} being applied to the data line. *Id.* at 20:63–66 (“the potential difference V_{pre13} that is larger than the threshold V_{th13} of the drive transistor Tr 13 is *applied to the opposite ends of the capacitor C_s* (namely, between the gate and the source of the drive transistor Tr 13).”). Importantly, V_{pre} is repeatedly and consistently referred to as the “***precharge voltage V_{pre}*** ” all throughout the specification. *See, e.g., id.* at 18:27–28; 19:2; 19:46; 20:22–45;

24:1; 26:42; 30:2; 32:39; 33:62; 34:6; 35:4; 38:15; 39:34; 40:36–41; 41:27–32. In contrast, Vpre13 is consistently referred to as the “*drive transistor precharge voltage Vpre13*.” *See, e.g., id.* at 21:1–8; 23:65; 26:37–38; 28:64–67; 29:31–32; 30:30–42. Vpre13 is *never* referred to as the “precharge voltage.”

That the “precharge voltage Vpre” is applied to the data line is consistent with the language of claim 11, which provides that “the data driver applies a precharge voltage exceeding a threshold value of the drive transistor to the data line, and the light emission drive circuit applies the *precharge voltage applied to the data line* to the electric charge accumulating section via the writing control section.” Thus, contrary to HP’s assertions, a POSITA would easily be able to determine that the “precharge voltage” in claim 11 corresponds to the “precharge voltage Vpre,” and *not* Vpre13.

Further, Samsung’s position that “precharge voltage” is indefinite is further undercut by its claim construction proposal for the disputed term “writing control section,” which uses the term “precharge voltage.” Finally, Samsung’s expert in its ex parte reexamination proceedings against the ‘615 patent, Dr. Adam Fontecchio, submitted a sworn declaration dated August 25, 2021, in which he offers opines on invalidity of claim 11 of the ‘615 patent, and in which he has no trouble applying the term “precharge” for purposes of his analysis and does not suggest or imply that the term would be indefinite to a POSITA. *See, e.g.,* Ex. 12 ¶¶ 19, 34, 53-56. To the extent Samsung maintains and articulates its indefiniteness position, Solas will respond.

C. “light emission control section” (’615 patent claim 11)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, i.e., circuit section that controls light emission	“drive transistor”

The phrase “writing control section” is composed of ordinary technical words and has a plain meaning in view of the intrinsic evidence. That meaning is circuit section that controls light emission. This follows from the claim language itself. Claim 11 recites a “light emission drive circuit” having four recited sections: (1) “an electric charge accumulating section” (2) “a light emission control section,” (3) “a writing control section,” and (4) “a voltage control section.” Each of these “sections” refer back to the light emission drive circuit and are sections of *that* drive circuit. Thus, the “light emission control section” is the section of the light emission drive circuit that controls light emission. And that is how the claim describes “a light emission control section”: it controls writing by “generating a light emission drive current having a predetermined current value in accordance with the electric charges accumulated in the electric charge accumulating section and supplying the light emission drive current to the light emission element. *See* Ex. 1 ¶¶ 92-75.

A POSITA would not understand “light emission control section” to be *limited* to being a “drive transistor,” which is also plainly what the inventors of the ’615 patent intended because, among other reasons, claim 2 both requires a “light emission control section” and specifies that the “light emission control section *includes* a drive transistor.” *See* Ex. 1 ¶ 93. A POSITA reading these claims would not assume, as Samsung proposes, that term “light emission control section” covers precisely the same scope as the term “drive transistor,” given that both terms are used simultaneously by the inventors in the same claim and in a manner that subordinates “drive transistor” to “light emission control section” such that one is included within the other. *Id.*

A POSITA would understand that the light emission control section may comprise circuitry such as a transistor.’615 patent at Fig. 1, 17:1–62. But that circuitry is not limited to a single transistor (as Samsung’s proposal requires). Nowhere does the applicant redefine or disclaim the meaning of “voltage control section” in such a way. *See Hill-Rom*, 755 F.3d at 1371 (Fed. Cir. 2014)

(“the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using ‘words or expressions of manifest exclusion or restriction.’”).

D. “writing control section” (’615 patent claim 11)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, i.e., circuit section that controls writing	“a selection transistor, which receives the gradation sequence signal and the precharge voltage from the data line”

The phrase “writing control section” is composed of ordinary technical words and has a plain meaning in view of the intrinsic evidence. That meaning is circuit section that controls writing. *See* Ex. 1 ¶¶ 73-75. This follows from the claim language itself. Claim 11 recites a “light emission drive circuit” having four recited sections: (1) “an electric charge accumulating section” (2) “a light emission control section,” (3) “a writing control section,” and (4) “a voltage control section.” As noted above, each of these “sections” refer back to the light emission drive circuit and are sections of *that* drive circuit. Thus, the “writing control section” is the section of the light emission drive circuit that controls writing. And that is how the claim describes “a writing control section”: it controls writing by “controlling a supplying state of the electric charges based on the gradation sequence signal to the electric charge accumulating section.”

Based on the specification, a POSITA would understand that the writing control section is a circuit section that controls writing, and may comprise circuitry such as transistor. *See* ’615 patent at Fig. 1 and related description at column 17; Ex. 1 ¶ 75. This comports well with the plain and ordinary meaning of the phrase and would be easily understood by a POSITA. That circuitry is not limited to a single transistor (as Samsung’s proposal requires), much less one “which receives the gradation sequence signal and the precharge voltage from the data line.” Samsung’s proposal is

flawed also because it proposes to add an additional functional requirement: “which receives the gradation sequence signal and the precharge voltage from the data line.” Nowhere does the applicant redefine or disclaim the meaning of “writing control section” in such a way, and Samsung’s attempt to manufacture additional functional requirements is improper and incorrect. *See* Ex. 1 ¶ 76.

E. “voltage control section” (’615 patent claim 11)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, i.e., circuit section that controls voltage	“holding transistor”

As noted above, each of the “section” terms in dispute for claim 11 refers back to the “light emission drive circuit”—they are sections of the drive circuit. That informs the plain meaning of voltage control section, and is used in the patent in accordance with that plain meaning, i.e., circuit section that controls voltage. That is consistent with the claims and specification. For example, the claim describes “a voltage control section” as performing the function of “controlling a drive voltage for making the light emission control section perform the operation.” Claim 11; *see also* Ex. 1 ¶¶ 89–91.

Based on the specification, a POSITA would understand that the voltage control section is a circuit section that controls voltage, and may comprise circuitry such as a holding transistor. *See* ’615 patent at Fig. 1 and related description at column 17. This comports well with Solas’s proposed construction and would be easily understood by a POSITA. It does not mean that, as Samsung’s proposal suggests, a POSITA would interpret “voltage control section” to *necessarily* a “holding transistor” and nothing else, which in any event is contradicted by claim language elsewhere in the ’042 patent, such as in claim 2 which requires that “the voltage control section

includes a hold transistor.” ‘615 patent, cl. 2 The ‘615 patent does not treat “voltage control section” and “holding transistor”/“hold transistor” as the same things as Samsung contends, which would be readily apparent to a POSITA reading the patent in the first place. Nothing in the specification or the claims suggests that the voltage control section is *limited* to a single transistor as Samsung’s proposal requires.

F. “the drive transistor” (‘615 patent claim 11)

Solas’s Proposed Construction	Samsung’s Proposed Construction
Plain and ordinary meaning, not indefinite. Alternatively, “a drive transistor included in the light emission control section.”	Indefinite.

Samsung may argue that “the drive transistor” is indefinite because the “the” article in front of “drive transistor” suggests that there is an antecedent “drive transistor” elsewhere in the claim. Samsung may also contend that if “light emission control section” is construed as “drive transistor,” then it will not contend that “the drive transistor” is indefinite for lack of antecedent basis. This approach is incorrect, for several reasons. A POSITA would understand the meaning and scope of the term “the drive transistor” within the claim phrase “a threshold value of the drive transistor,” with reasonable certainty in view of the claims, specification, and prosecution history. *See* Ex. 1 ¶ 95.

As stated above, a POSITA would understand “light emission control section” to have a plain and ordinary meaning, i.e., circuit section which controls light emission, and that such light emission control section could include, as the ‘615 patent provides, a drive transistor. *See* ‘615 patent, 17:1-43 (describing a “driving transistor” as a “light emission control means”). Indeed, a POSITA would not understand “light emission control section” to be *limited* to being a “drive transistor,”

not least because claim 2 both requires a “light emission control section” and specifies that the “light emission control section *includes* a drive transistor.” The term “light emission control section” cannot be said to cover precisely the same scope as the term “drive transistor” as Samsung contends, given that both terms are used simultaneously by the inventors in the same claim and in a different manner. *See* Ex. 1 ¶¶ 95-96.

However, as noted above, a POSITA would also readily understand that a “light emission control section” of the patent *may* include a drive transistor, because (among other reasons) the specification describes a “drive transistor” as a “light emission control means.” ’615 patent, 17:22-24. Ex. 1 ¶ 97. In the context of claim 11, a POSITA would readily understand that “the drive transistor” is referring to “*a* drive transistor included in the light emission control section,” as the POSITA’s understanding would be informed by the ’615 patent’s specification which discusses “drive transistor” as a component of the “light emission control section.” *See, e.g.*, ’615 patent 6:24-25 (“light emission control section may have a drive transistor”).

As a result, although the antecedent basis for the phrase “the drive transistor” is not explicit, the claim is nonetheless readily understandable. *See Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1376 (Fed. Cir. 2008) (noting “the well-settled rule that claims are not necessarily invalid for a lack of antecedent basis”); *see also Bose Corp. v. JBL, Inc.*, 274 F.3d 1354, 1359 (Fed. Cir. 2001) (noting that the Manual of Patent Examining Procedure provides an example that “the limitation ‘the outer surface of said sphere’ would not require an antecedent recitation that the sphere have an outer surface”).

Finally, Samsung’s expert in its *ex parte* reexamination proceedings against the ’615 patent, Dr. Adam Fontecchio, submitted a sworn declaration dated August 25, 2021, in which he opines on the alleged invalidity of claim 11 of the ’615 patent, and in which he has no trouble applying

the term “the drive transistor” for the purposes of his analysis and does not suggest or imply that the term would be indefinite to a POSITA, which undercuts Samsung’s indefiniteness position. *See* Ex. 12 ¶¶ 53-56.

G. “light emission drive circuit” (’615 patent claim 11)

Solas’s Proposed Construction	Samsung’s Proposed Construction
<p>Plain and ordinary meaning, i.e., circuit that controls light emission.</p> <p>Alternatively, “a drive circuit with a plurality of switching elements used to drive a light emission element of a pixel.”</p>	<p>“the circuit that includes the switching and storage elements used to drive a light emission element of a pixel”</p>

The term “light emission drive circuit” needs no construction because its words are readily understandable to a POSITA as having a plain and ordinary meaning: circuit that controls light emission.” *See* Ex. 1 ¶ 84.

Samsung’s proposal, which is unsupported by the ’615 patent, is the same proposed construction as it has proposed for the term “pixel circuit” in the ’042 patent. There is no basis for assigning the same construction to two different terms from two different patents which share inventors and an initial assignee, who intentionally chose the words and phrases for a reason. Further, Samsung’s construction for “light emission drive circuit” suffers from the same defects as its proposal for “pixel circuit.” For instance, it is unclear what Samsung’s proposal means where it refers to “the switching and storage elements” used to drive an OLED element of a pixel. Samsung may intend “switching ... elements” to be the other claimed “sections” of the light emission drive circuit such as the writing control section or the voltage control section. Samsung may also intend “storage elements” to be the “electric charge accumulating section for accumulating electric charges.” *Id.* cl. 1. If this is the case, the additional limitations are superfluous and do nothing to the scope of

the claim except to potentially improperly limit it by requiring the presence of “elements” within the circuit. *See* Ex. 1 ¶ 85.

Alternatively, Samsung may intend for “the switching and storage elements” to encompass *all* “switching” and “storage” elements which are “used drive a light emission element of a pixel,” even if a POSITA would typically not understand some elements fitting that description as being a part of the “pixel circuit.” As one example, the ’615 patent illustrates multiple “transistor switch SWpr” components as part of an embodiment’s “Data Driver,” as shown in Figures 17 through 19. These transistor switches are arguably used in driving the OLED pixels because, among other reasons, such transistor switches in the data driver drive the column DL (data lines) in the pixel circuits. But transistor switches SWpr are not suggested by the ’615 patent to be a part of the “pixel circuit,” and a POSITA would understand them to be a part of the current or column driver and not to be a part of the pixel circuit. Samsung’s proposal carries an inherent ambiguity which has the potential to be expanded beyond the plain and ordinary meaning of “light emission drive circuit” by encompassing switches and storage elements outside of what a POSITA would understand a “light emission drive circuit” to be. *See* Ex. 1 ¶ 86.

Alternatively, if the Court decides that “light emission drive circuit” should be construed, it should be construed as “a drive circuit with a plurality of switching elements used to drive a light emission element of a pixel.” This construction is supported the inventors’ description of what they meant by “light emission drive circuit”:

In such a light emission element type of display, various drive control mechanisms and control methods for controlling the operation of the light emission element (the light emission state) are suggested. For example, as described in Jpn. Pat. Appln. KOKAI Publication No. 8-330600, there has been known a configuration including *a drive circuit provided with a plurality of switching elements for light-emission-drive controlling the light emission element* (hereinafter, abbreviated as “*a light emission drive circuit*”) for each display pixel to compose a display panel in addition to the above-described light emission element.

(‘615 patent, 1:60-2:3).

The inventor’s definition of “a light emission drive circuit” indicates that it is simply a “drive circuit” with a “plurality of switching elements” for controlling the driving of a light emission element. Samsung’s proposal adds a “storage elements” requirement, which is unsupported generally by the specification and specifically the inventors’ definition. *See* Ex. 1 ¶¶ 87-88. Indeed, the specification suggests that “storage elements,” to the extent Samsung contends “storage elements” necessarily are capacitors, are not even necessary. For example, the ‘615 patent states that “capacitor Cs may be a *parasitic capacitance* formed between a gate and a source of the drive transistor Tr 13 or it may be made by further connecting a capacitance element between the contact point N11 and the contact point N12 in parallel in addition to the parasitic capacitance.” ’615 patent, 17:44-48. In such an embodiment, a “capacitor” might be functionally depicted on a circuit diagram but, in reality, would simply be the parasitic capacitance formed between a gate and a source of the drive transistor. *Id.*

H. “data lines” (‘615 patent claim 11)

Solas’s Proposed Construction	Samsung’s Proposed Construction
<p>Plain and ordinary meaning, i.e., lines through which data is supplied.</p> <p>Alternatively, “lines to which the data driver supplies gradation sequence signals and applies a precharge voltage.”</p>	<p>“conductive lines each of which connects a data driver to a plurality of light emission drive circuits and carries both a gradation sequence signal and a precharge voltage”</p>

The term “data line” is used eighty-eight times throughout the ‘615 patent in a consistent and clear manner. Data line is a well-known term in the art. The term “data line” is readily understood by a POSITA, has a plain and ordinary meaning, and is used in the ‘615 patent in accordance with that plain meaning, i.e., conductive lines for supplying information. *See* Ex. 1 ¶ 77. For example, the McGraw-Hill Dictionary provides the following definition: “data transmission line: [ELEC] A

system of electrical conductors, such as a coaxial cable or pair of wires, used to send information from one place to another or one part of a system to another.” Ex. 5 at 3 (p. 490). The patent teaches that gradation sequence signals and a precharge voltage can be applied to the data lines. *See* ’615 patent at 5:49–50 (“a data driversupplies a gradation sequence signal to the data line”); *see also* Fig. 1 and 17:5–16 (describing DL in Fig. 1 as a data line). This is consistent with Solas’s plain and ordinary meaning proposal, which is that data lines are lines through which data is supplied.

Samsung’s proposal is incorrect and unsupported and not the plain and ordinary meaning. For example, the specification does not state that each individual data line must “connect[] a data driver to a plurality of light emission drive circuits.” Samsung’s proposal purports to require a one to many relationship between data lines and a light emission drive circuit. But this requirement is not part of the plain meaning of “data lines” or required by the intrinsic evidence. *See* Ex. 1 ¶ 78.

Should the Court decide it is appropriate to construe “data lines” despite its plain and ordinary meaning which would be apparent to a POSITA, “data lines” may be appropriately construed to be: “lines to which the data driver supplies gradation sequence signals and applies a precharge voltage.” ’615 patent at 5:49–50 (“a data driversupplies a gradation sequence signal to the data line”), 18:27-30, 37:46-38:19; *see also* Fig. 1 and 17:5–16. *See* Ex. 1 ¶ 79.

VII. CONCLUSION

For the foregoing reasons, Solas respectfully requests that the Court adopt Solas’s proposed constructions, which comport with the plain meaning of the terms, as understood by a POSITA in view of the specification and reject Samsung’s constructions which improperly import limitations from preferred embodiments into the claims, or in some cases ignore the clear teachings of the specification altogether.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that on February 2, 2022, all counsel of record who are deemed to have consented to electronic service are being served with a copy of this document via the Court's CM/ECF system pursuant to Local Rule CV-5(a)(3)(A).

/Reza Mirzaie/